

Boy Wrestles With Scalp Problem



An 8-year-old boy is brought in by his mother for evaluation of a scalp condition that manifested several months ago. The first sign was hair loss in several locations, mostly on the sides, followed in a few weeks by faint scaling. As more hair came out, the scaling in the affected locations reduced, but uniformly spaced black dots began to appear. There has never been any redness.

The boy was taken to a local urgent care center, where he was

diagnosed with probable “ring-worm” and given a prescription for topical antifungal cream (clotrimazole, bid application). This failed to help, so the family sought an appointment with dermatology.

Additional history-taking reveals that the boy noticed the problem within a few weeks of starting wrestling at school.

Examination of the scalp reveals several round areas of partial and uniform hair loss, averaging 3 cm in diameter. No redness or edema is seen, and only very faint scaling is observed on the surface of the skin. Distinct black dots are uniformly distributed within the lesions.

A vigorous scrape of one of the areas is processed with potassium hydroxide 10% and examined under 10x magnification. The black

dots are found to be broken-off hairs filled with hundreds of tiny round spheres. Several hyphae are seen adjacent to the hairs.

Palpation reveals adenopathy in the adjacent nuchal scalp and neck. Wood’s lamp examination fails to highlight these areas.

Which of the following statements is true of this patient’s condition?

- The causative organism was probably acquired from another human.
- This particular problem is seen mostly in children.
- Most common fungal infections do not fluoresce under Wood’s lamp examination.
- Host response, or lack thereof, plays a major role in the clinical presentation of these infections.
- All the above

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sea, vomiting, diarrhea, and constipation. While you are conducting the review, he states, "It just started again." You immediately check the patient's pulse; it is 110 beats/min and irregular.

Additional vital statistics include a blood pressure of 124/74 mm Hg; respiratory rate, 14 breaths/min; O₂ saturation, 96% on room air; and temperature, 98.4°F. His weight is 245 lb and his height, 72 in.

Pertinent physical findings include inspiratory and expiratory crackles that change with coughing, an irregularly irregular rhythm without evidence of a murmur or rub, a soft abdomen,

and no evidence of jugular venous distention or peripheral edema. Laboratory values are within normal limits, with the exception of the potassium (2.8 mmol/L; normal range, 3.6-5.2 mmol/L) and magnesium (0.9 mg/dL; normal range, 1.8-2.6 mg/dL).

An ECG reveals a ventricular rate of 108 beats/min; PR interval, not measured; QRS duration, 78 ms; QT/QTc interval, 352/471 ms; no P axis; R axis, -64°; and T axis, -58°. What is your interpretation of this ECG?

ANSWER

The correct interpretation is coarse atrial fibrillation with a

rapid ventricular response and left-axis deviation.

Coarse atrial fibrillation is evidenced by the irregularly irregular rhythm with a normal QRS duration and flutter/fibrillation waves arising from the atria. Rapid ventricular response is defined as a ventricular response > 100 beats/min (seen in this case). Finally, an R-wave axis between -30° and -90° is indicative of left-axis deviation.

Correcting the patient's hypokalemia and hypomagnesemia resulted in a return to normal sinus rhythm. At one-year follow-up, he had had no further episodes of atrial fibrillation. **CR**

DERMIDIAGNOSIS

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ANSWER

The correct answer is all of the above (choice "e"). This particular form of tinea capitis is called *black dot tinea capitis* (BDTC), a somewhat unusual dermatophytosis (superficial fungal infection) that mostly affects children. The causative organisms are anthropophilic—that is, acquired from human sources, such as other children, during activities that involve skin-to-skin contact (eg, sports).

The vast majority of these organisms are from the *Trichophyton* family, such as *T tonsurans* or *T violaceum*. They invade the hair shaft itself, leaving the hard

covering (the cuticle) intact. The black dots represent the tips of broken-off hairs, themselves full of fungal elements, seen in the photomicrograph. The term *endothrix* is given to this kind of fungal infection, in which the organisms are contained within the hair shaft, which, as a result, becomes brittle and breaks off. This is a relatively common type of infection.

A more unusual form of tinea capitis is caused by zoophilic organisms, such as *Microsporum canis* (from dogs and cats), *Microsporum gypseum* (pigs or cows), or *T equinum* (horses). These infect the external surface

of the hair shaft, breaking down the cuticle. This allows for identification of the infection by Wood's lamp, which causes the affected area to turn a yellowish color. These infections also tend to provoke a more brisk inflammatory response in the victim and are more difficult to treat.

Diagnosis can be made from a combination of clinical findings, KOH prep (as in this patient), and/or fungal culture.

Treatment can entail griseofulvin or terbinafine; the case patient was treated with a two-month course of the latter (125 mg/d). Topical treatment is of limited usefulness. **CR**